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123. Proposed by W. J. GREENSTREET, M. A., Editor of The Mathematical Gazette, Stroud, Gloucestershire, England.

Two equal uniform rods AB , BC are freely hinged at B ; C rests on a rough horizontal plane, and A is attached to a point above it. When C is as far as possible from A for equilibrium, AB , BC make angles α , β , respectively, with the vertical. Find the coefficient of friction between the rod at C and the plane.

*** Solutions of these problems should be sent to B. F. Finkel not later than July 10.

AVERAGE AND PROBABILITY.

107. Proposed by L. C. WALKER, Assistant Professor of Mathematics, Leland Stanford Jr. University, Palo Alto, Cal.

Two points are taken at random in the curved surface of a hemisphere. Show (1) that the average length of the straight therein is $\frac{32r}{9\pi}$; and (2) that the average length of the arc of a great circle, which joins them, is $\frac{4r}{\pi}$.

108. Proposed by A. H. HOLMES, Brunswick, Me.

Required the average area of the quadrilateral whose sides are a , b , c , and d .

109. Proposed by G. B. M. ZERE, A. M., Ph. D., Professor of Chemistry and Physics, The Temple College, Philadelphia, Pa.

A cylinder pierces a sphere in such a manner that the cylinder is tangent internally to the projection of the sphere in the plane xy . Find (1) the average surface, (2) the average volume of the sphere included within the cylinder.

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MISCELLANEOUS.

108. Proposed by G. B. M. ZERE, A. M., Ph. D., Professor of Chemistry and Physics, The Temple College, Philadelphia, Pa.

To divide the arc of a cardioid into eight equal parts.

109. Proposed by J. SCHEFFER, A. M., Hagerstown, Md.

Find the latitude of the place where the sun's centre remains above the horizon for a hundred successive days.

In problem 105, Miscellaneous, April Number, Vol. VIII, No. 4,

$$\frac{2x}{a} = \frac{c}{a} l^{y/a} + \frac{a}{c} l^{-y/a} \text{ should be } \frac{2x}{a} = \frac{c}{a} e^{y/a} + \frac{a}{c} e^{-y/a}.$$

*** Solutions of these problems should be sent to J. M. Colaw not later than July 10.